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Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Currently Amended) A test management server for a test system that includes comprising a first computer having an input means and an output; means; a second computer, connected to the first computer via a network including the Internet, and having an input means and an output; means; a test management server connected to the first and second computers via the network; and a problem database, accessible by the test management server, for storing a plurality of problems each of which is assigned pre-estimated item parameters including a [[the]] difficulty level and an identifiability of the problem, wherein the test system presents n problems to one testee so as to estimate the ability θ of the testee from his/her responses to the problems, [[said]] the test management server being connected to the first and second computers and being configured to: comprising:

in response means, responsive to a request transmitted from the first computer, select for selecting from the problem database n problems to be marked in such a manner that allows a partial score r_j to be given to the testee's response to a problem j, and transmit transmitting the selected problems to the first computer, wherein $0 \le r_j \le 1$ with 1 being a full mark and $1 \le j \le n$;

store answer storage means for storing an answer returned from the first computer in response ; responsive to each of the problems selected from the problem database and transmitted to the first computer;

in response means, responsive to a request transmitted from the second computer, read the stored for reading answers stored in the answer storage means, and transmit transmitting the read answers to the second computer;

receive, partial score storage means for receiving from the second computer, a partial score r_j assigned to the testee's answer transmitted to the second computer, and store storing the partial score r_j; and

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estimate ~~ability estimation means for estimating~~ the ability θ of the testee who acquires the partial score r_j on the basis of the <u>stored</u> partial score r_j ~~stored in the partial-score storage means~~ and the item parameters of the problem j stored in the problem database; ~~and~~

wherein, in <u>estimating</u> the ability, ~~prediction means, assuming that~~ the partial score r_j is <u>treated as</u> an average value of true-false responses which the testee latently indicates to latent problems to which the testee ~~latently~~ indicates the <u>correct</u> response of ~~correct answer of~~ 1 or the wrong response of 0 <u>and that</u> are repeatedly performed s_j times, <u>and,</u> when $P_j(\theta)$ is the probability that the testee can correctly answer the latent problem and when $Q_j(\theta)$ is 1 - $P_j(\theta)$, the ability θ of the testee is estimated using the logarithmic likelihood $l_{part}(\theta)$ represented by<u>:</u> ~~the following Equation:~~

[Equation 40]

$$\ell_{part}(\theta) = \sum_{j=1}^{n} s_j \left(r_j \ln\left(P_j(\theta)\right) + \left(1 - r_j\right)\ln\left(Q_j(\theta)\right)\right)$$

2. (Currently Amended) The test <u>management server</u> [[system]] according to claim 1, wherein $P_j(\theta)$ is represented as follows using a 2-parameter logistic model:

[Equation 41]

$$P_j(\theta) = \frac{1}{1 + \exp\left(-Da_j\left(\theta - b_j\right)\right)}$$

where a_j and b_j ~~in Equation 41~~ respectively indicate the identifiability and the difficulty level which are the proper feature of the problem stored in the problem database, and D is a constant of 1.7.

3. (Currently Amended) The test <u>management server</u> [[system]] according to claim 2, characterized in that when the observed partial score r_j for the problem j is configured by an average of a plurality of manifest true-false problems, the correct answer rate of these true-false problems is represented by Equation 41, and the ability θ of a testee can be estimated using Equation 40.

4. (Currently Amended) The test <u>management server</u> [[system]] according to ~~any of~~

~~claims 1 to 3~~ <u>claim 1</u>, characterized in that the ability distribution of a group on which a test is conducted is assumed, the product of the binomial distribution, which is a true-false sum of s_j, and the assumed ability distribution is integrated by the dimension of the ability to obtain the theoretical distribution function of a partial score, and the s_j, which is the iterations of latent problems, can be estimated such that the obtained theoretical distribution function can best <u>match</u> ~~matches~~ the empirical distribution function of the partial score of the actual data.

5. (Currently Amended) The test <u>management server</u> [[system]] according to ~~any of claims 1 to 4~~ <u>claim 1</u>, characterized in that the output ~~means~~ and the input ~~means~~ of the first and second computers respectively comprise a voice output ~~means~~ and a voice input, ~~means,~~ and an answer transmitted to<u>, and stored by,</u> the test <u>management</u> server ~~and stored~~ includes voice data.

6. (Currently Amended) A method for controlling a test system having a first computer having <u>an</u> input ~~means~~ and <u>an</u> output, ~~means,~~ a second computer, connected to the first computer over a network including the Internet, <u>and</u> having <u>an</u> input ~~means~~ and <u>an</u> output, ~~means,~~ a test management server connected to the first and second computers over the network, and a problem database accessible by the test management server and storing a plurality of problems for which an item parameter including a difficulty level and <u>an</u> identifiability is estimated in advance, with the test system presenting n problems to one testee, and the ability θ of the testee being evaluated from the response of the testee to the presented n problems, <u>the method comprising:</u> ~~characterized in that:~~

~~said test management server comprises:~~

(1) ~~a step of~~ selecting n problems to be marked in an aspect allowing partial score r_j where $0 \leq r_j \leq 1$ with perfect 1 for the problem j where $1 \leq j \leq n$ from the problem database in response to a request transmitted from the first computer, and transmitting the selected problems to the first computer;

(2) ~~a step of~~ storing an answer returned from the first computer in response to the problem selected from the problem database and transmitted to the first computer;

(3) ~~a step of~~ reading <u>a stored</u> [[an]] answer ~~stored in said step (2)~~ in response to <u>a</u> [[the]] request transmitted from the second computer, and transmitting the read answer to the

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second computer;

(4) a step of receiving and storing a partial score r_j assigned to the answer transmitted to the second computer from the second computer, , and storing it; and

(5) a step of estimating the ability θ of a testee who acquires the partial score r_j using the stored partial score r_j stored in said step (4) and the item parameter of the problem j stored in the problem database, and

wherein in said step (5), $P_j(\theta)$ refers to the probability that the testee can correctly answer the latent problem assuming that the partial score r_j is proper to the problem j and is an average value of true-false responses response which the testee latently indicates when the latent problems to which the testee latently indicates a correct [[the]] response of the correct answer of 1 or an incorrect the wrong response of 0 are repeatedly performed s_j times, and, when $Q_j(\theta)$ is 1 - $P_j(\theta)$, the ability θ of the testee is estimated using the logarithmic likelihood $l_{part}(\theta)$ represented by: the following Equation.

[Equation 42]

$$\ell_{part}(\theta) = \sum_{j=1}^{n} s_j \left(r_j \ln\left(P_j(\theta)\right) + \left(1 - r_j\right) \ln\left(Q_j(\theta)\right)\right)$$

7. (Currently Amended) The method according to claim 6, characterized in that $P_j(\theta)$ is represented as follows using a 2-parameter logistic model:

[Equation 43]

$$P_j(\theta) = \frac{1}{1 + \exp\left(-Da_j\left(\theta - b_j\right)\right)}$$

where a_j and b_j in Equation 43 respectively indicate the identifiability and the difficulty level which are the proper feature of the problem stored in the problem database, and D is a constant of 1.7.

8. (Original) The method according to claim 7, characterized in that when the observed partial score r_j for the problem j is configured by an average of a plurality of manifest true-false problems, the correct answer rate of these true-false problems is represented by Equation 43, and the ability θ of a testee can be estimated using Equation 42.

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9. (Currently Amended) The method according to ~~any of claims 6 to 8~~ claim 6, characterized in that [[(6)]] the ability distribution of a group on which a test is conducted is assumed, the product of the binomial distribution, which is a true-false sum of s_j, and the assumed ability distribution is integrated by the dimension of the ability to obtain the theoretical distribution function of a partial score, and the s_j which is the iterations of latent problems can be estimated such that the obtained theoretical distribution function can best match ~~matches~~ the empirical distribution function of the partial score of the actual data.

10. (New) The test management server according to claim 2, characterized in that the ability distribution of a group on which a test is conducted is assumed, the product of the binomial distribution, which is a true-false sum of s_j, and the assumed ability distribution is integrated by the dimension of the ability to obtain the theoretical distribution function of a partial score, and the s_j, which is the iterations of latent problems, can be estimated such that the obtained theoretical distribution function can best match the empirical distribution function of the partial score of the actual data.

11. (New) The test management server according to claim 2, characterized in that the output and the input of the first and second computers respectively comprise a voice output and a voice input, and an answer transmitted to, and stored by, the test management server includes voice data.

12. (New) The test management server according to claim 3, characterized in that the ability distribution of a group on which a test is conducted is assumed, the product of the binomial distribution, which is a true-false sum of s_j, and the assumed ability distribution is integrated by the dimension of the ability to obtain the theoretical distribution function of a partial score, and the s_j, which is the iterations of latent problems, can be estimated such that the obtained theoretical distribution function can best match the empirical distribution function of the partial score of the actual data.

13. (New) The test management server according to claim 3, characterized in that the

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output and the input of the first and second computers respectively comprise a voice output and a voice input, and an answer transmitted to, and stored by, the test management server includes voice data.

14. (New) The test management server according to claim 4, characterized in that the output and the input of the first and second computers respectively comprise a voice output and a voice input, and an answer transmitted to, and stored by, the test management server includes voice data.

15. (New) The method according to claim 6, characterized in that the output and the input of the first and second computers respectively comprise a voice output and a voice input, and a stored answer includes voice data.

16. (New) A computer-readable storage medium on which is stored a computer program that instructs a computer to execute the method according to claim 6.

17. (New) A computer program that instructs a computer to execute the method according to claim 6.

18. (New) The method according to claim 7, characterized in that the ability distribution of a group on which a test is conducted is assumed, the product of the binomial distribution, which is a true-false sum of s_j, and the assumed ability distribution is integrated by the dimension of the ability to obtain the theoretical distribution function of a partial score, and the s_j which is the iterations of latent problems can be estimated such that the obtained theoretical distribution function can best match the empirical distribution function of the partial score of the actual data.

19. (New) The method according to claim 7, characterized in that the output and the input of the first and second computers respectively comprise a voice output and a voice input, and a stored answer includes voice data.

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20. (New) The method according to claim 8, characterized in that the ability distribution of a group on which a test is conducted is assumed, the product of the binomial distribution, which is a true-false sum of s_j, and the assumed ability distribution is integrated by the dimension of the ability to obtain the theoretical distribution function of a partial score, and the s_j which is the iterations of latent problems can be estimated such that the obtained theoretical distribution function can best match the empirical distribution function of the partial score of the actual data.

21. (New) The method according to claim 8, characterized in that the output and the input of the first and second computers respectively comprise a voice output and a voice input, and a stored answer includes voice data.

22. (New) The method according to claim 9, characterized in that the output and the input of the first and second computers respectively comprise a voice output and a voice input, and a stored answer includes voice data.